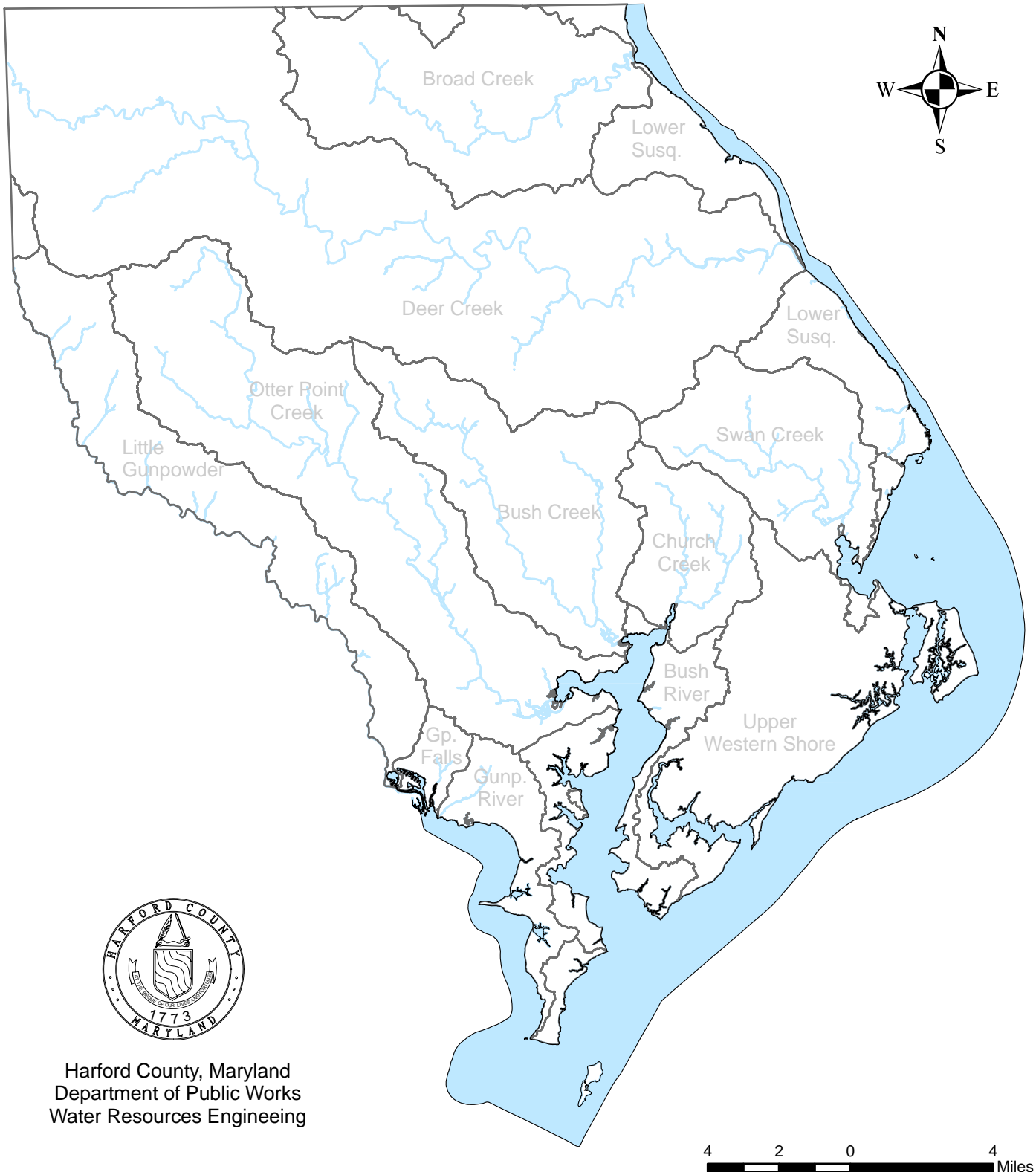


Harford County, Maryland

National Pollutant Discharge Elimination System

2004 Annual Report Executive Summary

September 2005



National Pollutant Discharge Elimination System

Municipal Separate Storm Sewer System Discharge Permit

Annual Report Executive Summary

Harford County, Maryland

Permit Number MD0068268

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Background

The NPDES or National Pollutant Discharge Elimination System program is federally mandated by the Environmental Protection Agency (EPA) under the Clean Water Act. The Clean Water Act was originally drafted to regulate point source discharges into the waters of the U.S. from locations such as sewage treatment plants and industrial facilities. These point source discharges are required to obtain an NPDES permit that outlines required discharge limits and monitoring requirements.

In 1987, Congress adopted Amendments to the Clean Water Act that emphasized nonpoint source discharges. Under the 1987 Amendments, permit requirements were established for stormwater discharges from municipal separate storm sewer systems (MS4s), or stormdrain systems from large (populations greater than 250,000) and medium (populations greater than 100,000 and less than 250,000) municipalities. As a medium municipality, Harford County began the lengthy two-part permit application process in 1992. The application process involved such activities as mapping the County storm sewer systems, identifying the stormwater management facilities, and implementing a water quality monitoring program. The second part of the process built upon the inventory of data and focused on program implementation.

The Maryland Department of the Environment (MDE) has been established as the reviewing agency for Maryland that includes thirteen counties. Harford County received its first generation NPDES permit on May 17, 1994. The permit outlined such activities as long term water quality monitoring, public outreach of water quality issues, and watershed studies. Every five (5) years the County must resubmit an application for its NPDES permit. Harford County received its second generation NPDES permit on August 13, 1999 and its third generation NPDES permit on November 1, 2004.

Annually, Harford County Water Resources who administers the County's municipal NPDES program is required to submit a report to MDE about the progress of the programs outlined in the County's permit. The following executive summary covers calendar 2004, the final annual report covered under the second generation permit.

Overview Second Generation Permit (Calendar years 2000 – 2004)

The second-generation permit written by MDE continued to require water quality assessments and information gathering that would assist the jurisdictions in maintaining, developing and implementing surface water quality programs.

Some of the information gathering programs involved continued maintenance of GIS data and database information for such features as stormdrain systems, stormwater management facilities, stormwater waivers, stormwater exemptions, impervious cover, landuse and locations of water quality monitoring sites.

The second generation permit required the selection of a single long-term water quality monitoring site that along with the other permitted jurisdictions would be analyzed by MDE to

determine appropriate pollutant loadings based on landuses. The long-term monitoring included physical monitoring of stream cross-sections and profiles, biological monitoring of macroinvertebrate insects, and chemical monitoring during storm events and during baseflow.

An additional long-term monitoring site was required to determine the effectiveness of implementing the 2000 Maryland Design Manual for stormwater management. The monitoring required for this site was limited to physical monitoring of stream cross sections and profiles.

The second-generation permit required the continuation and documentation of existing water quality programs such as stormwater management maintenance inspections, erosion and sediment control plan review and inspection, and the adoption and implementation of new stormwater management design guidelines outlined in the 2000 Maryland Design Manual. Other required management programs included implementation of a public outreach program and the reduction of pollutants generated from road maintenance activities.

Lastly, the second-generation permit required the development and implementation of systematic watershed assessments to determine the locations of water quality problems and a methodology and schedule for remediating those problems.

2004 Annual NPDES Program Accomplishments

The following is a brief summary of activities completed during calendar year 2004 for the NPDES program. The summary highlights major programs and should not be considered all-inclusive. For a detailed description of all of the activities, refer to the enclosed CD.

- **Source Identification**

- Water Resources continued maintenance of GIS layers and associated attributes for the following features. The associated number of features for each is shown in parentheses.
 - Stormdrain systems – New stormdrain systems are input for county roads accepted during the calendar year. **For calendar year 2004, the following features were input – outfalls (45), inlets (383), manholes (253), stormdrain pipe (661).**
 - Stormwater management facilities – New stormwater management facilities are input for facilities as-built during the calendar year. There has been a one-year lag time in inputting this data. A new system was created in Fall 2004 to eliminate this lag-time for the next Annual Report submittal. **For calendar year 2003, the following features were input – stormwater management facilities (33).**
 - Miscellaneous stormwater management – New development not required to provide stormwater management during the calendar year are input. **For calendar year 2004, the following features were input – stormwater management waivers (18), stormwater management exemptions (6), stormwater management fees-in-lieu (10).**
 - Water quality monitoring sites – Water Resources maintains an inventory of water quality monitoring sites that are associated with their programs. **For calendar year 2004, the following monitoring sites were active – chemical (13), physical (4), biological (7), flow (5).**
 - Potential polluters – Water Resources maintains an inventory of industrial and commercial businesses with activities that could be sensitive to surface water quality. This list is developed from an inventory provided by Water & Sewer of commercial accounts and through listings in the telephone book. **For calendar year 2004, the following businesses were identified – businesses with activities sensitive to surface water quality (649).**
 - Impervious cover – Water Resources previously generated an inventory of impervious cover for the entire county based on aerial photography taken in Spring 2000. **For calendar year 2004, the impervious cover data**

was segregated by general ownership or maintenance responsibility including incorporated towns, state, and county.

- Estimated pollutant loads – Water Resources previously generated an inventory for estimated pollutant loads utilizing ten large-scale watersheds for the entire county. **For calendar year 2004, the pollutant load estimates were updated utilizing smaller drainage areas allowing for finer estimates of loadings in areas of concentrated development.**
- Water Resources created new GIS layers and associated attributes for the following features. The associated number of features for each is shown in parentheses.
 - Waste water treatment plants – Water Resources created an inventory of waste water treatment plants from information supplied by Water & Sewer. **For calendar year 2004, the following facilities were identified – waste water treatment plants (7).**
 - Landfills – Water Resources created an inventory of landfills from information supplied by Maryland Department of the Environment. **For calendar year 2004, the following facilities were identified – active landfills (3), inactive landfills (4).**
- **Monitoring Programs**
 - Ambient long term monitoring station - A 170 acre watershed located within the Winters Run watershed west of the Town of Bel Air and drains the subdivisions of Brentwood Park and Woodland Hills.
 - Chemical monitoring - From 1998 to present, surface water is monitored during baseflow and stormflow conditions at an outfall and instream station and analyzed for nutrients, metals, phenols, total petroleum hydrocarbons and fecal coliform bacteria.
 - **During 2004, samples were collected during nine (9) stormflow events and ten (10) baseflow events.**
 - A water quality data analysis was completed to determine event mean concentrations (EMC), comparisons to State water quality criteria, annual and seasonal loading rates, and yields for each constituent.
 - Results indicate a strong seasonality in fecal coliform with concentrations during summer months ten (10) times higher than non-summer months.

- The average yearly EMCs are significantly lower when compared to Maryland NPDES data and the Nationwide Urban Runoff Program data with the exception of nitrate plus nitrite.
- Biological monitoring - From 1998 to present, benthic macroinvertebrates are collected biannually at three stations in the stream reach extending from the instream to the outfall station.
- **Index of Biotic Integrity scores indicate ratings of very poor to poor at most stations during most years indicating a generally degraded biological condition. Further results indicate degradation is not due to organic pollution.**
- Physical monitoring - From 1999 to present, a physical stream assessment is conducted in the stream reach and a cross-sectional survey and longitudinal profile is plotted to determine the rate of change in the channel geometry.
- **Each of the three cross sections appear to be stable with cross section two demonstrating minor aggradation and degradation due to the loss of a large tree in 2003.**
- U. S. Geological Survey stream gaging network
 - The County and USGS are cost sharing efforts to operate stream gages on Bynum Run (1999 – present), Plumtree Run (2001 – present) and James Run (2003 – present). Data collected at these stations is used by federal, state and local agencies for assessing water quality and water supply, watershed based resource planning, and designing and assessing highways, bridges and culverts. Data is available at <http://waterdata.usgs.gov/md/nwis/rt>.
- Department of Natural Resources (DNR) tidal and non-tidal monitoring
 - Since 2003, the County and DNR are partnering to monitor “real time” shallow water conditions in the Bush River. This data for the local waterways will provide physical and nutrient data necessary to evaluate water quality criteria under development by the State of Maryland and EPA. Data is available at www.eyesonthebay.net.
 - Since 2003, the County and DNR are partnering to monitor surface water and discharge during baseflow and stormflow conditions at six stations located on tributaries flowing into the Bush River. Water quality samples are analyzed for nutrients and total suspended solids in order to characterize loads being discharged into the estuary.

- Total Maximum Daily Load (TMDL) monitoring program
 - Since 2003, surface water samples are collected quarterly at six stations on Winters Run, Bynum Run and Plumtree Run in support of MDE's TMDL program to quantify nutrient levels during baseflow conditions.
- Maryland Stormwater Design Manual – Wexford development - The Wexford project is a 181 acre commercial redevelopment and new residential development that was selected to assess the state's best management practice criteria. The project area is served by two stormwater management facilities that meet new stormwater guidelines.
 - **In 2003 and 2004 the stream channel was surveyed to evaluate physical characteristics and stream channel stability in conjunction with the ensuing development. Annual assessments will be completed to track changes.**
- **Management Programs**
 - A variety of management programs are outlined in the NPDES program that are administered by Water Resources along with many that are administered by other agencies that require coordination by Water Resources.
 - Stormwater management maintenance inspections – During 2004, 94% of the 261 stormwater management facilities inspected were either in compliance or required minimal maintenance. Three major repairs continue to remain outstanding with anticipation that the County will need to complete the repairs and collect the funds for the beneficial users. Outreach to homeowners associations, property management companies and landscaping companies continues to assist in improvements to stormwater maintenance.
 - Pollution prevention plan development – Water Resources continues to identify and document County-owned facilities that require a NPDES discharge permit and ensures that permits and pollution prevention plans are updated and valid. Coordination with departments outside of Public Works including the Board of Education will be necessary to ensure complete coverage.
 - Illegal dumping and spill coordination – Water Resources continues to coordinate with Water and Sewer, the Health Department and the Emergency Operations Hazmat Team to respond to illegal dumping, sewer overflows, and hazardous waste spills, along with maintaining appropriate procedures for public reporting and awareness and citizen complaints.

- Public outreach activities – Water Resources continues to participate in Earth Day, Wade-In, Farm Fair, various school activities, environmental workshops, and producing an environmental newsletter to promote environmental and watershed awareness.
- Road maintenance activities – The Highways Bureau tracks the number of road miles swept (1,963), the number of miles mowed (1,503), the number of inlet structures cleaned (2,485) and the number of gallons of herbicide applied (1,399). This information is used to calculate the pollutant reduction associated with road maintenance activities.

- **Watershed Restoration Programs**

- Harford County was required to develop a watershed restoration program based on water quality assessments on a watershed basis and to restore ten percent of the county's impervious surface. An assessment of the Bush River watershed was completed in 2003 that outlines several restoration strategies including both structural improvements through a capital improvement program and non-structural programs.
- **For calendar year 2004, the updated impervious cover layer was used to reduce the amount of impervious cover that Harford County is responsible for restoring by removing state roadways.** The amount of impervious cover was reduced from 9,408 acres to 8,308 acres reducing the County's required ten percent restoration goal to 831 acres of impervious cover.
- **For calendar year 2004, Water Resources submitted a table of capital improvement projects projected to be completed through calendar year 2008** which would provide restoration for approximately 50% of the required impervious cover.
- Capital improvement project status
 - Through the end of calendar year 2004, Water Resources has completed seven capital improvement projects including four stream restorations and three stormwater retrofits totaling over one and a half million dollars with approximately 35% of the costs supplied by grant funding.
 - **During calendar year 2004, Water Resources completed two capital improvement projects – a bioretention facility and a pocket wetland both located at the Harford Center Facility.**
 - **During calendar year 2004, Water Resources initiated the construction of two capital improvement projects projected to be completed in Spring 2005 – a bioretention facility and stormwater retrofit both located in the Laurel Valley development.**

- **During calendar year 2004, Water Resources completed concept designs for three capital improvement projects – Laurel Valley stream restoration, Bynum Ridge stream restoration, and Plumtree Run at Tollgate Road stream restoration.**
- **During calendar year 2004, Water Resources initiated the design of one capital improvement project projected to be completed in 2005 – Plumtree Run at Tollgate Road stream restoration.**
- Non-structural programs
 - Outreach programs - Several outreach programs were proposed within the Bush River watershed study to increase public awareness of water quality issues that could potentially lead to improved water quality. The following outreach programs were developed and/or continued during calendar year 2004.
 - Bush River watershed video - Water Resources has partnered with Maryland Public Television to develop a segment on Outdoors Maryland to showcase the Bush River watershed, the watershed assessment study and restoration projects. Water Resources has received a grant to cover a portion of the costs of the video that is projected to air February 2006.
 - Water Resources website - Water Resources began gathering information for updating the Water Resources pages located on the County's website to incorporate information specific to the Bush River Watershed study and restoration programs. Water Resources will coordinate with the County's webmaster for these updates in 2005.
 - Adopt-a-pond – The stormwater management division has developed a grant program for homeowners associations to receive funding from the county for landscaping existing stormwater management facilities. This will allow the community to embrace the facility as an amenity to their neighborhood rather than an “eye-sore” as many of them are now viewed. The first grants are anticipated in 2005.
 - Grays Run – In 2004, Water Resources began coordinating with the Harford County Land Trust to investigate large tracts of contiguous forested and wetland areas along stream valleys for preservation.

2005 Annual NPDES Program Proposed Activities

- **Source Identification**

- Impervious cover – Water Resources anticipates determining areas of impervious cover that are managed by existing stormwater management facilities. This will allow for updates to the impervious cover layer and data attributes and will allow Water Resources to determine the amount of impervious cover that is untreated.

- **Monitoring Programs**

- Bacterial monitoring
 - In 2005, bacteria levels in surface water will be measured in terms of *E. coli* concentrations and no longer as fecal coliform concentrations. *E. coli* has become the indicator of choice for bacteria at the Federal and State levels.
 - Water Resources and Water and Sewer are developing a baseline monitoring program to determine bacteria concentrations in selected streams within the County's development envelope where bacteria levels are currently unknown.
 - To better address the source of fecal coliform contamination at the County's long term monitoring station, Water Resources is developing a monitoring plan for Bacterial Source Tracking (BST) in this watershed.
 - In July 2005, Water Resources and USGS initiated a baseline water quality project to sample surface water on Bynum Run and Plumtree Run at the stream gages. Samples are collected monthly during baseflow conditions and are analyzed for nutrients and *E. coli*.
- Physical monitoring
 - Water Resources anticipates contracting with KCI Technologies, Inc. to complete the physical assessment and a hydrological and hydraulic study for the Wexford development.

- **Management Programs**

- Illicit discharge inspection program
 - Water Resources anticipates contracting with EA Engineering to develop an inspection program to meet the new requirements for the third-generation permit.

- Illegal spills and dumping
 - Water Resources anticipates continuing to improve coordination with Water and Sewer, the Health Department, and Emergency Operations with respect to implementing the County's response to illegal spills and dumping including public outreach efforts.
- **Watershed Restoration Programs**
 - Capital improvement programs
 - Pre-design monitoring is anticipated for the Woodbridge stormwater retrofit and stream restoration (9/2005 – 8/2006) and the Sunnyview stream restoration (9/2005 – 8/2006). These two projects will be the first monitoring projects conducted by Water Resources prior to initiating design and it is anticipated that it will provide critical information for the design and for determining pollutant reductions after construction has been completed.
 - Concept design is anticipated for the Moose Lodge stream restoration project (4/2005 – 12/2005).
 - Final designs are anticipated for the Plumbtree Run at Tollgate Road stream restoration (1/2005 – 12/2005), the Laurel Valley stream restoration (7/2005 – 6/2006), and the Bynum Ridge stream stabilization (10/2005 – 8/2006).
 - No construction projects are anticipated.

Overview Third Generation Permit (Calendar years 2005 – 2009)

The third-generation permit written by MDE continues to require water quality assessments and information gathering that would assist the jurisdictions in maintaining, developing and implementing surface water quality programs with additional focus on quantification of pollutant reductions associated with program implementation.

New information gathering programs involve quantification of the impervious cover managed by existing stormwater management facilities and the quantification of impervious cover managed by restoration projects.

The third-generation permit continues to require monitoring of a long-term water quality monitoring sites but now provides the flexibility to move to other locations that may provide the jurisdictions with more applicable data. Biological and physical monitoring will continue to be a requirement for the long-term monitoring site although MDE has reduced the number of required storm event sampled for chemical monitoring from 12 to 8.

The third-generation permit requires the continuation and documentation of existing water quality programs such as stormwater management maintenance inspections, erosion and sediment control plan review and inspection, public outreach and the reduction of pollutants generated from road maintenance activities. More focus on improving the illicit discharge programs across jurisdictions has been emphasized by requiring routine surveys of commercial and industrial areas where illegal dumping and spills may exist.

Lastly, the third-generation permit requires the assessment of an additional watershed and the implementation of water quality improvements to restore and additional 10% of impervious cover during the permit coverage.

The new general TMDL language incorporated within the third-generation permit along with MDE's focus on requiring quantification of water quality improvements will provide Harford County with the ability to meet the requirements of both programs.